RESEARCH DEPARTMENT

THE SERVICE AREAS OF THE GREAT GLEN CHAIN OF TELEVISION AND V.H.F. SOUND TRANSMITTERS

Technological Report No. K-171
(1964/24)

R.C. Vercoe
H.T. Madoc-Jones
J.A. Carter

W Proctor Wilson

(W. Proctor Wilson)

This Report is the property of the British Broadcasting Corporation and may not be reproduced in any form without the written permission of the Corporation.

Report No. K-171

THE SERVICE AREAS OF THE GREAT GLEN CHAIN OF TELEVISION AND V.H.F. SOUND TRANSMITTERS

Section Title Page

SUBJECT 1

1. THE GREAT GLEN CHAIN 1

2. SUMMARIZED DESCRIPTION OF THE TRANSMITTERS 1

3. SURVEY RESULTS 1

4. COMMENTS ON SERVICES 2

  4.1. General 2
  4.2. Fort William 2
  4.3. Ballachulish 2
  4.4. Kinlochleven 2
  4.5. Oban 2

APPENDIX I 13

APPENDIX II 14

April 1964

Technological Report No. K-171

(1964/24)

THE SERVICE AREAS OF THE GREAT GLEN CHAIN OF TELEVISION AND V.H.F. SOUND TRANSMITTERS

SUBJECT

The results of field strength surveys of the Great Glen Chain of television and v.h.f. sound transmitters are given in this report.

1. THE GREAT GLEN CHAIN

The chain comprises the stations at Fort William, Ballachulish, Kinlochleven and Oban. All of these stations radiate television and v.h.f. sound programmes except Ballachulish, which radiates television only.

The parent station for the chain is Rosemarkie. On the high ground above Fort Augustus both television and v.h.f. sound transmissions are received and the vision signal is re-radiated by s.h.f. link to the Fort William transmitter. The Fort William television transmission is received at Ardgour, where a split s.h.f. link feeds the signals direct to the Ballachulish transmitter and via a passive reflector to Oban. Ballachulish radiates the vision transmission on Band I and the signal is re-broadcast by Kinlochleven. The v.h.f. Third and Light Programmes distribution from Fort Augustus is by GPO line. The Home Service is fed to the chain from Glasgow by GPO line. A schematic diagram showing the television and v.h.f. sound distribution through the Glen is given in Fig. 1. The geographical locations of the v.h.f. transmitters and s.h.f. link sites are shown in Fig. 2.

2. SUMMARIZED DESCRIPTION OF THE TRANSMITTERS

Details of the Great Glen transmitters are given in Appendix I.

3. SURVEY RESULTS

In Figs. 3 and 4, 5 and 6, and 7 and 8 are shown the field strength contours of the Fort William, Kinlochleven and Oban television and v.h.f. sound transmissions respectively. The contours for the Ballachulish television transmission are given in Fig. 9. Composite maps showing the nominal field strength limits of the television and v.h.f. sound services (40 dB(μV/m) for television and 48 dB(μV/m) for v.h.f. sound) provided in the Great Glen are given in Figs. 10 and 11 respectively.

The values of measured field strength for both services exceeded at 10%, 50% and 90% of the locations in the towns and villages measured are given in Appendix II.

4. COMMENTS ON SERVICES

4.1. General

The terrain on both sides of the Great Glen is very mountainous. From this it follows that:

(i) The service areas of the stations are very restricted.

(ii) The field strength contours shown cannot be other than approximate.

(iii) The field strength protected against United Kingdom co-channel interference may be less than the value indicated on the maps.

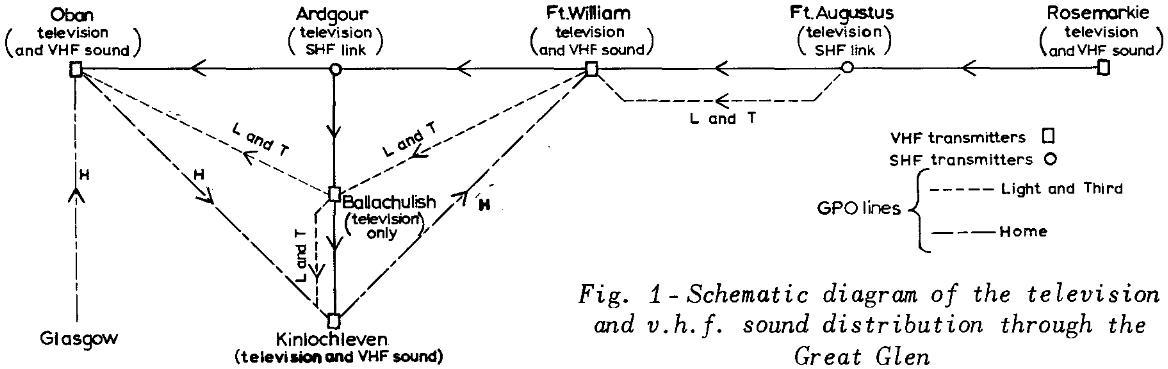

Oban (television and VHF sound)
Ardgour (television SHF link)
Ft.William (television and VHF sound)
Ft.Augustus (television SHF link)
Rosemarkie (television and VHF sound)
L and T
L and T
L and T
L and T
H
H
H
Ballachulish (television only)
Glasgow
Kinlochleven (television and VHF sound)
VHF transmitters □
SHF transmitters ○
GPO lines
Light and Third
Home

Fig. 1 - Schematic diagram of the television and v.h.f. sound distribution through the Great Glen

4.2. Fort William

The Fort William station provides excellent services in the town of Fort William and all nearby villages except Corpach. Corpach is situated at the entrance to Loch Eil, but is screened locally from the transmitter. This village is also subject to severe ghost signals reflected from the surrounding mountains.

4.3. Ballachulish

The Ballachulish station (television only) provides an excellent service in Onich, North Ballachulish, Glencoe, East Laroch and West Laroch.

4.4. Kinlochleven

The Kinlochleven television and v.h.f. sound transmitters provide very good services in the village of Kinlochleven and, together with the Ballachulish station, they provide a very good television service throughout the entire length of Loch Leven.

4.5. Oban

The Oban television and v.h.f. sound transmitters serve the population on or near the shores of Loch Linnhe, the Firth of Lorne and the Sound of Mull. Tobermory, at the distant end of the Sound of Mull, is well served with a median field strength of 61 dB(μV/m).

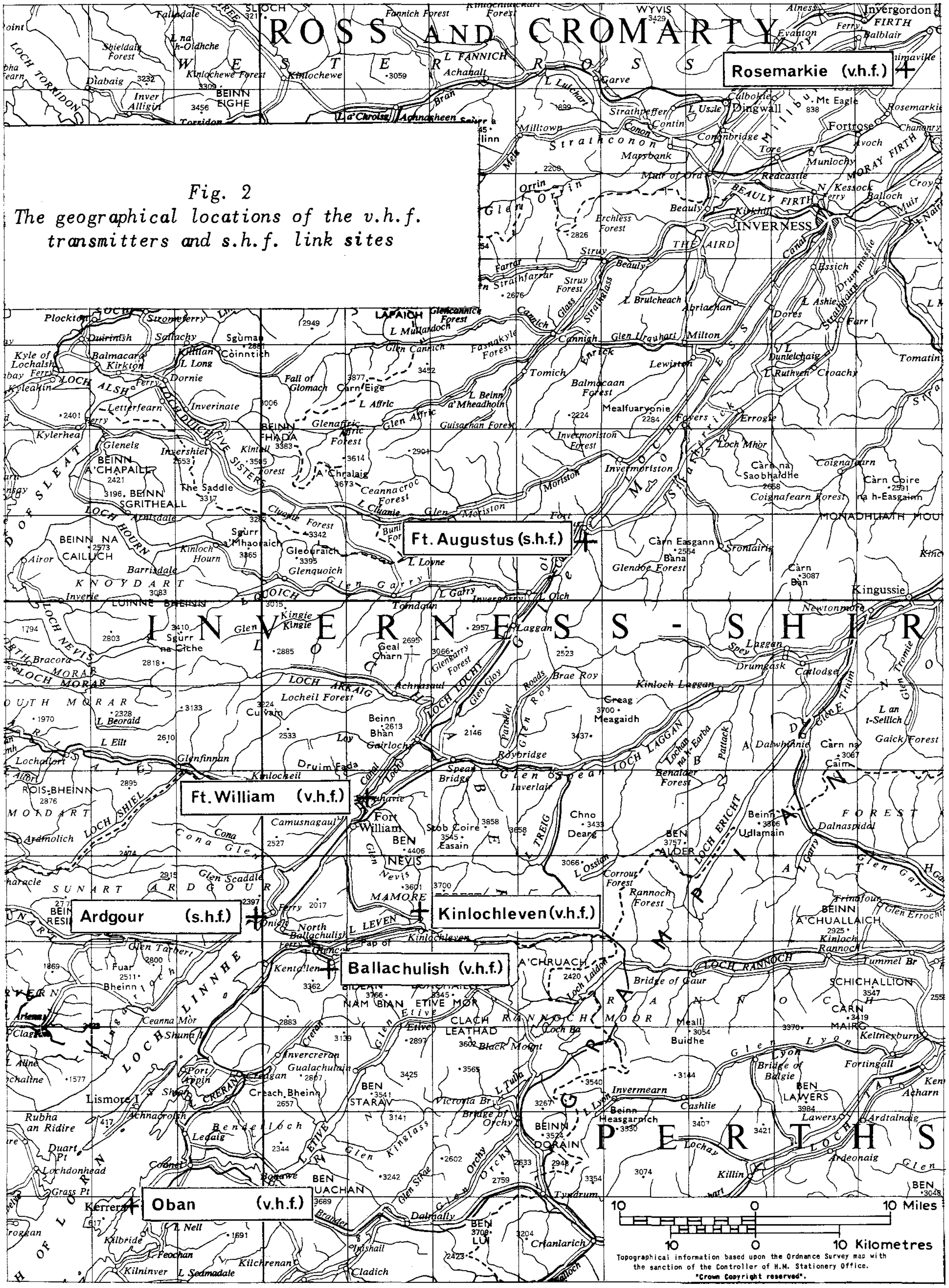


Fig. 2
The geographical locations of the v.h.f. transmitters and s.h.f. link sites

Topographical information based upon the Ordnance Survey map with the sanction of the Controller of H.M. Stationery Office.
"Crown Copyright reserved".

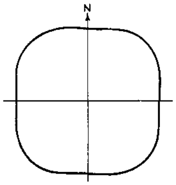
Fig. 3

Map T.578 - FORT WILLIAM

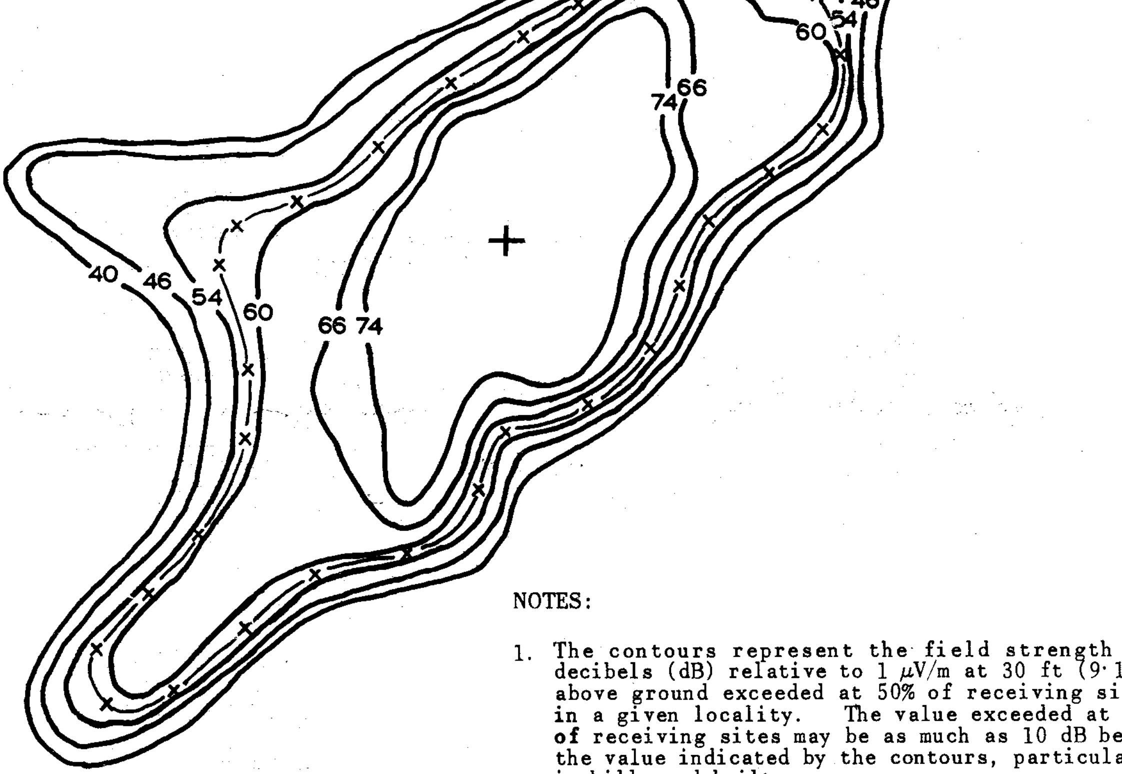
Band I Channel 5 (Measured)

SITE HEIGHT:	50 ft (15·2 m) a.m.s.l.
AERIAL HEIGHT:	147 ft (45 m) a.g.l.
E.R.P.:	1·4 - 1·8 kW
POLARIZATION:	HORIZONTAL
AERIAL:	TWO TIER SUPERTURNSTILE

H.R.P.:



AERIAL SECTION
DWG. NO.
AE. 509



NOTES:

1. The contours represent the field strength in decibels (dB) relative to 1 μV/m at 30 ft (9·1 m) above ground exceeded at 50% of receiving sites in a given locality. The value exceeded at 90% of receiving sites may be as much as 10 dB below the value indicated by the contours, particularly in hilly and built-up areas.

2. –x–x–x– Limit of service area free from perceptible co-channel interference from all U.K. co-channel transmitters for 90% of the time based on a protection ratio of 45 dB with a reduction of 10 dB for cross polarization and 10 dB for frequency offsets, allowance being made for receiving aerial directivity.

Fig. 4

Map. F.174 - FORT WILLIAM

Band II (Measured)

(Light 89·3 Mc/s; Third 91·5 Mc/s; Home 93·7 Mc/s)

SITE HEIGHT: 50 ft (15·2 m) a.m.s.l.

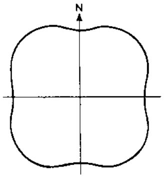
AERIAL HEIGHT: 118 ft (36 m) a.g.l.

E.R.P.: 1·2 - 1·7 kW

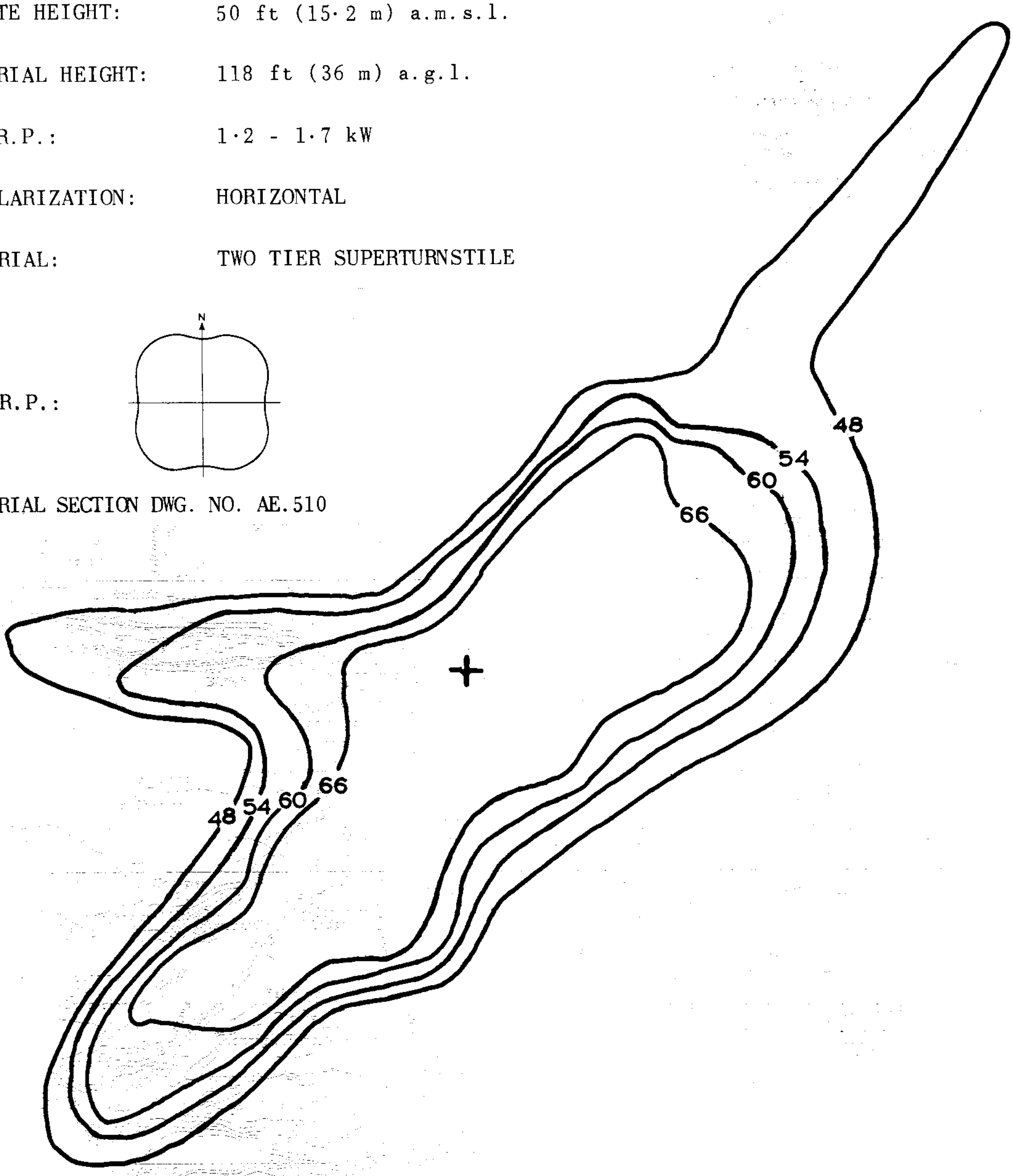
POLARIZATION: HORIZONTAL

AERIAL: TWO TIER SUPERTURNSTILE

H.R.P.:



AERIAL SECTION DWG. NO. AE.510



NOTES:

1. The contours represent the field strength in decibels (dB) relative to 1 μV/m at 30 ft (9·1 m) above ground exceeded at 50% of receiving sites in a given locality. The value exceeded at 90% of receiving sites may be as much as 10 dB below the value indicated by the contours, particularly in hilly and built-up areas.

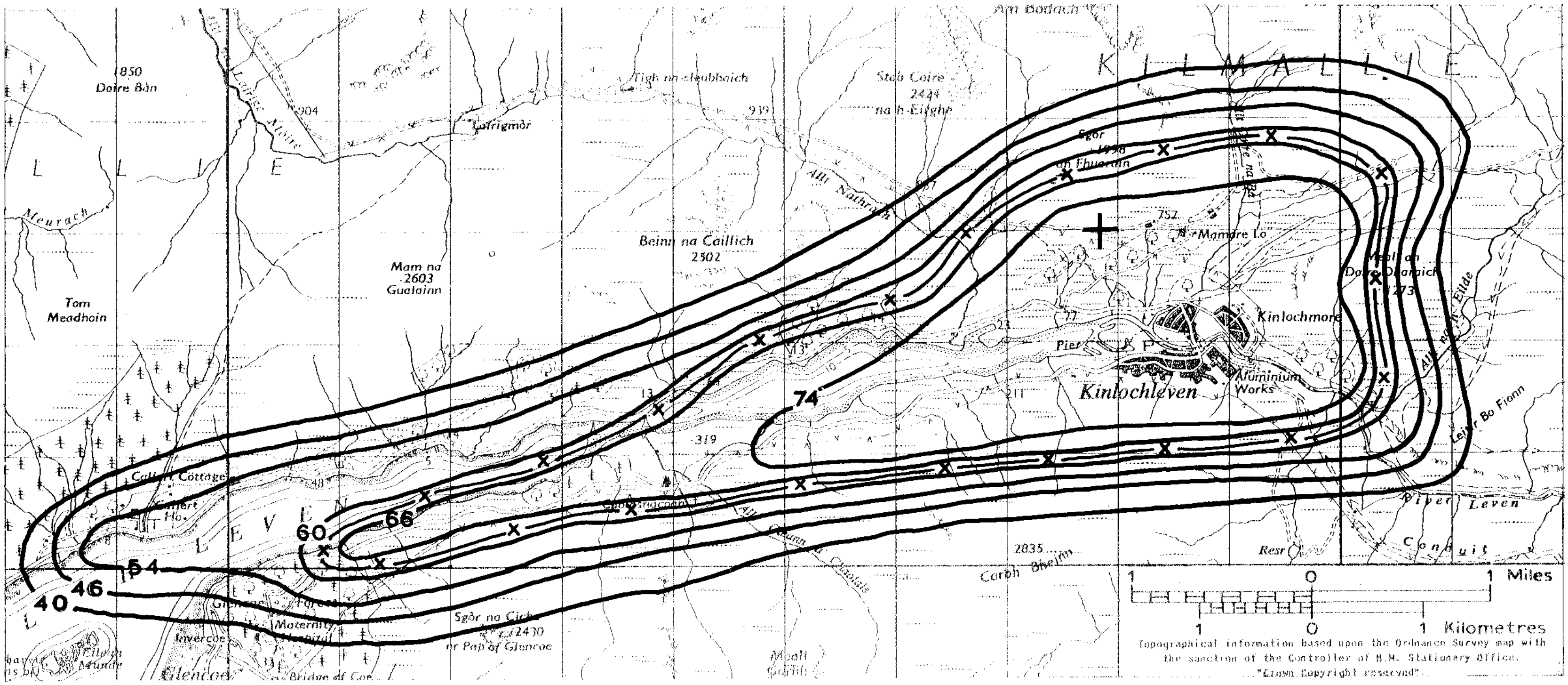


Fig. 5

Map T.587 - KINLOCHLEVEN

Band I Channel 1 (Measured)

SITE HEIGHT: 900 ft (274 m) a.m.s.l.

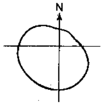
E.R.P.: 0·62 - 5 watts

AERIAL HEIGHT: 50 ft (15·2 m) a.g.l.

POLARIZATION: VERTICAL

AERIAL: SINGLE VERTICAL DIPOLE

H.R.P.:



NOTES:

1. The contours represent the field strength in decibels (dB) relative to 1 μV/m at 30 ft (9·1 m) above ground exceeded at 50% of receiving sites in a given locality. The value exceeded at 90% of receiving sites may be as much as 10 dB below the value indicated by the contours, particularly in hilly and built-up areas.

2. —x—x—x— Limit of service area free from perceptible co-channel interference from all U.K. co-channel transmitters for 90% of the time based on a protection ratio of 45 dB with a reduction of 10 dB for cross polarization and 10 dB for frequency offsets, allowance being made for receiving aerial directivity.

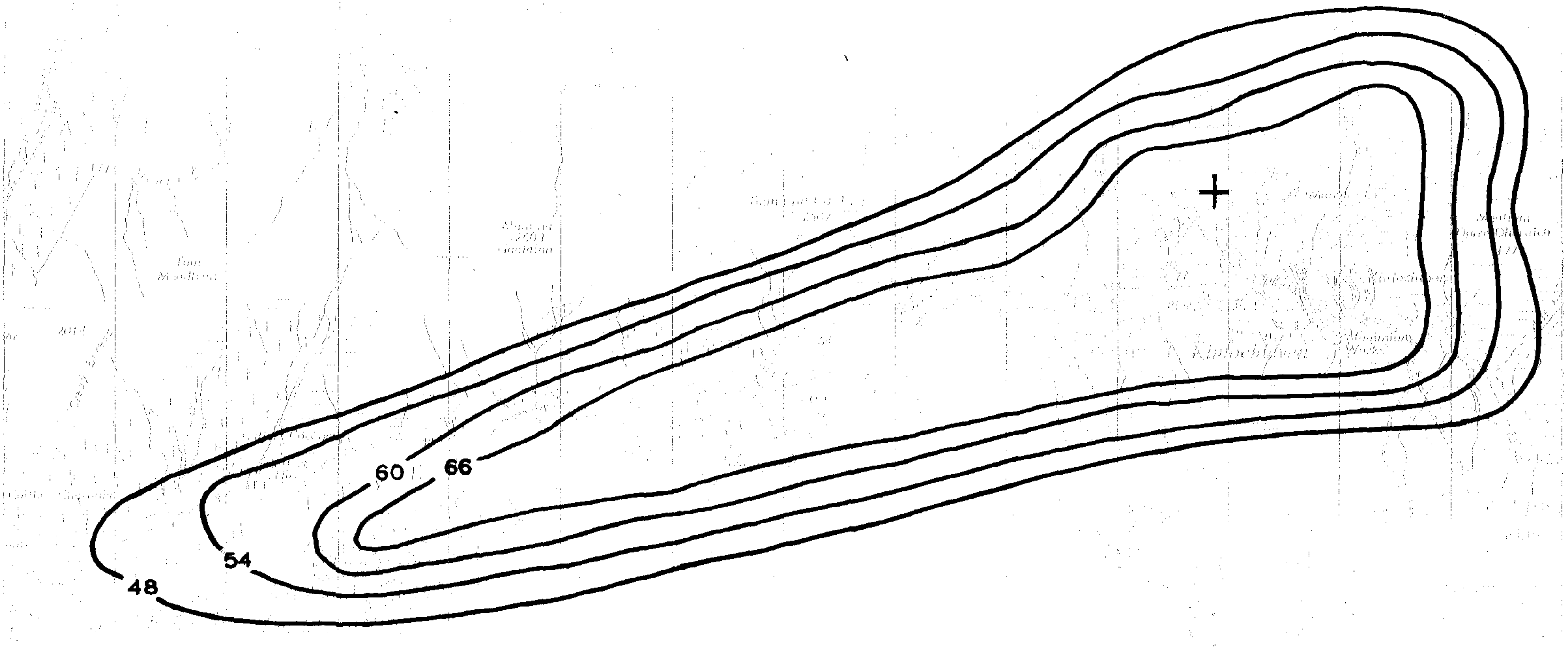


Fig. 6

Map F.182 - KINLOCHLEVEN

Band II (Measured)

(Light 89·7 Mc/s; Third 91·9 Mc/s; Home 94·1 Mc/s)

SITE HEIGHT: 900 ft (274 m) a.m.s.l.

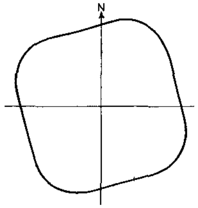
AERIAL HEIGHT: 67 ft (20·2 m) a.g.l.

E.R.P.: 1·7 - 2·3 watts

POLARIZATION: HORIZONTAL

AERIAL: SINGLE TIER CROSSED DIPOLE

H.R.P.:



RESEARCH DEPARTMENT REPORT NO. E-088

NOTES:

The contours represent the field strength in decibels (dB) relative to 1 μV/m at 30 ft (9·1 m) above ground exceeded at 50% of receiving sites in a given locality. The **value exceeded at 90% of receiving** sites may be as much as 10 dB below the value indicated by the contours, particularly **in hilly** and built-up areas.

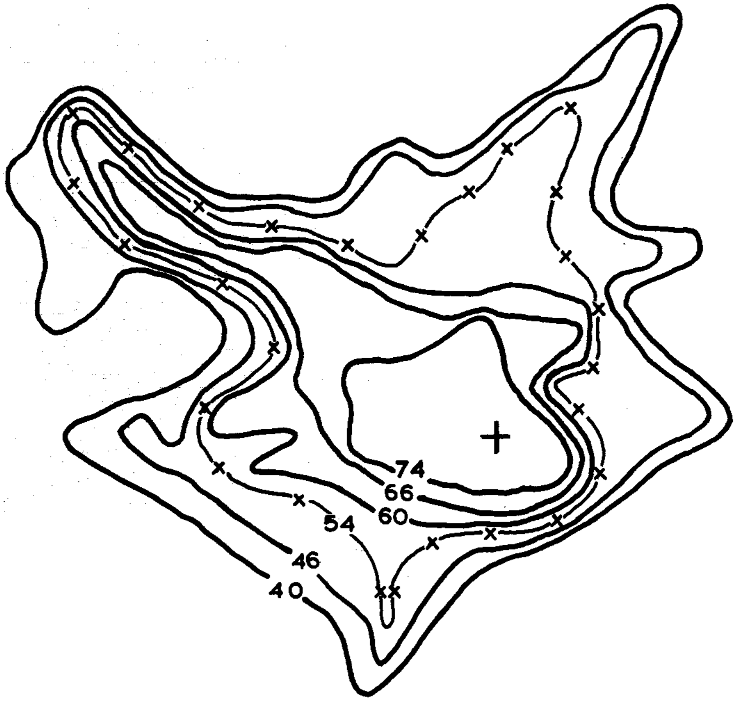


Fig. 7

Map T.589 - OBAN

Band I Channel 4 (Measured)

SITE HEIGHT: 400 ft (122 m) a.m.s.l.

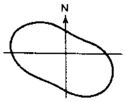
AERIAL HEIGHT: 132 ft (40 m) a.g.l.

E.R.P.: 0·36 - 3·2 kW

POLARIZATION: VERTICAL

AERIAL: TWO TIERS VERTICAL DIPOLES

H.R.P.:



RESEARCH DEPARTMENT REPORT NO. E-090

NOTES:

1. The contours represent the field strength in decibels (dB) relative to 1 μV/m at 30 ft (9·1 m) above ground exceeded at 50% of receiving sites in a given locality. The value exceeded at 90% of receiving sites may be as much as 10 dB below the value indicated by the contours, particularly in hilly and built-up areas.

2. —x—x—x— Limit of service area free from perceptible co-channel interference from all U.K. co-channel transmitters for 90% of the time based on a protection ratio of 45 dB with a reduction of 10 dB for cross polarization and 10 dB for frequency offsets, allowance being made for receiving aerial directivity.

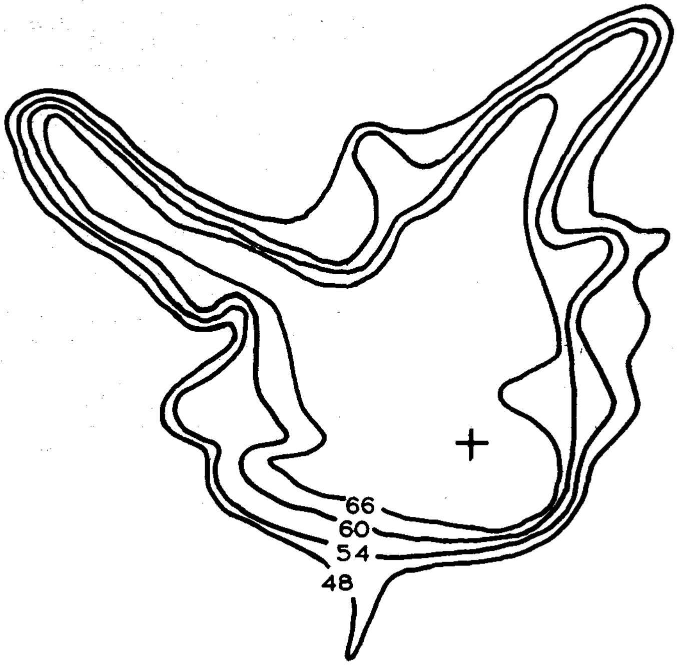


Fig. 8

Map F.183 - OBAN

Band II (Measured)

(Light 88·9 Mc/s; Third 91·1 Mc/s; Home 93·3 Mc/s)

SITE HEIGHT: 400 ft (122 m) a.m.s.l.

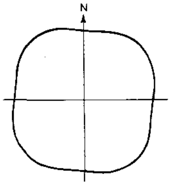
AERIAL HEIGHT: 162 ft (49·4 m) a.g.l.

E.R.P.: 1·25 - 1·7 kW

POLARIZATION: HORIZONTAL

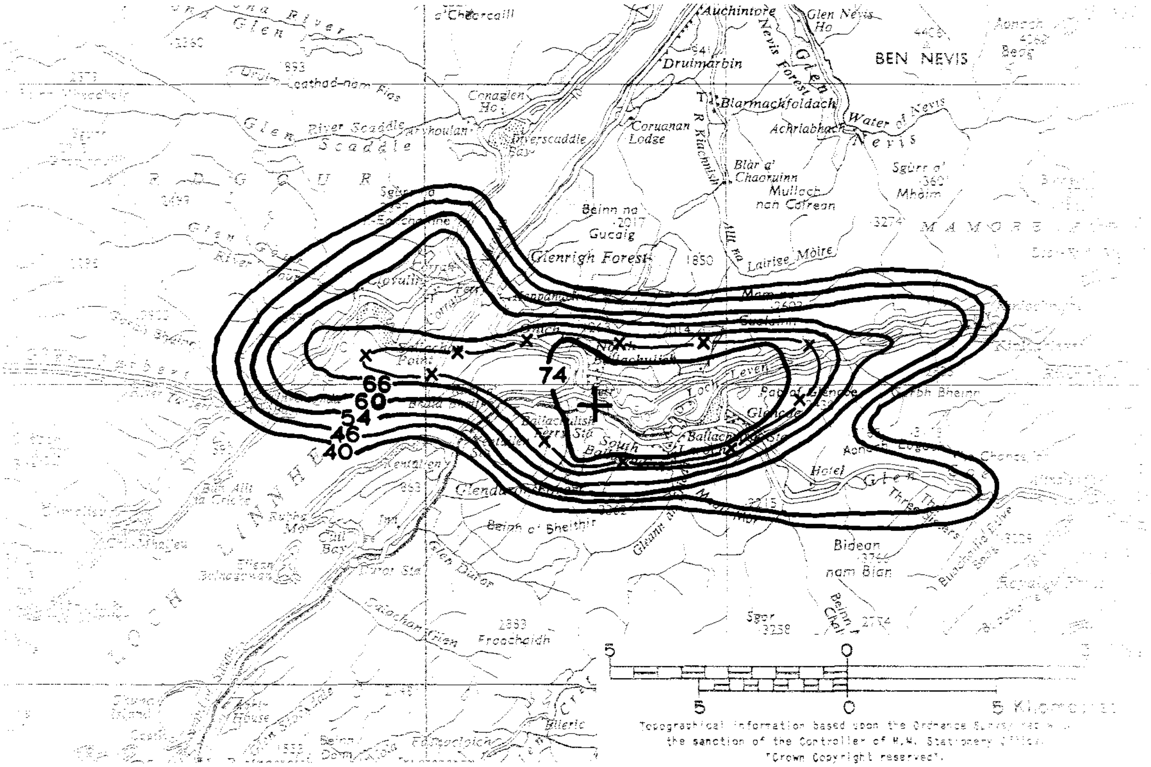
AERIAL: TWO TIERS CROSSED DIPOLES

H.R.P.:



NOTES:

The contours represent the field strength in decibels (dB) relative to 1 μV/m at 30 ft (9·1 m) above ground exceeded at 50% of receiving sites in a given locality. The value exceeded at 90% of receiving sites may be as much as 10 dB below the value indicated by the contours, particularly in hilly and built-up areas.



Topographical information based upon the Ordnance Survey map with the sanction of the Controller of H.M. Stationery Office. "Crown Copyright reserved".

Fig.9

Map T.586 - BALLACHULISH

Band I Channel 2 (Measured)

SITE HEIGHT: 50 ft (15·2 m) a.m.s.l.

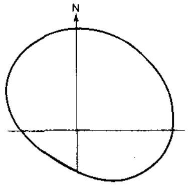
AERIAL HEIGHT: 110 ft (33·5 m) a.g.l.

E.R.P.: 14 - 112 watts

POLARIZATION: VERTICAL

AERIAL: SINGLE VERTICAL DIPOLE

H.R.P.:



RESEARCH DEPARTMENT REPORT NO. E-089

NOTES:

1. The contours represent the field strength in decibels (dB) relative to 1 μV/m at 30 ft (9·1 m) above ground exceeded at 50% of receiving sites in a given locality. The value exceeded at 90% of receiving sites may be as much as 10 dB below the value indicated by the contours, particularly in hilly and built-up areas.

2. —x—x—x— Limit of service area free from perceptible co-channel interference from all U.K. co-channel transmitters for 90% of the time based on a protection ratio of 45 dB with a reduction of 10 dB for cross polarization and 10 dB for frequency offsets, allowance being made for receiving aerial directivity.

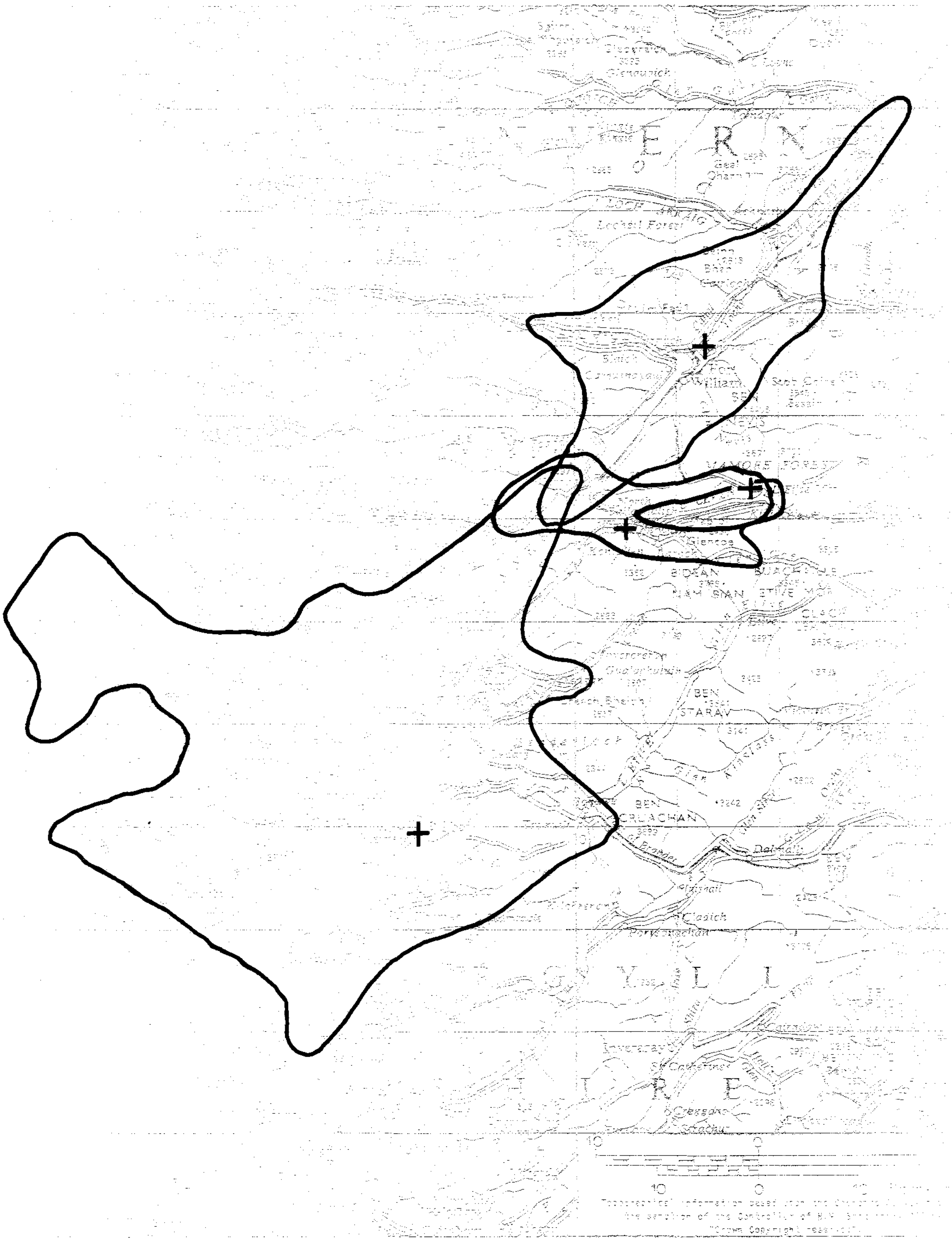
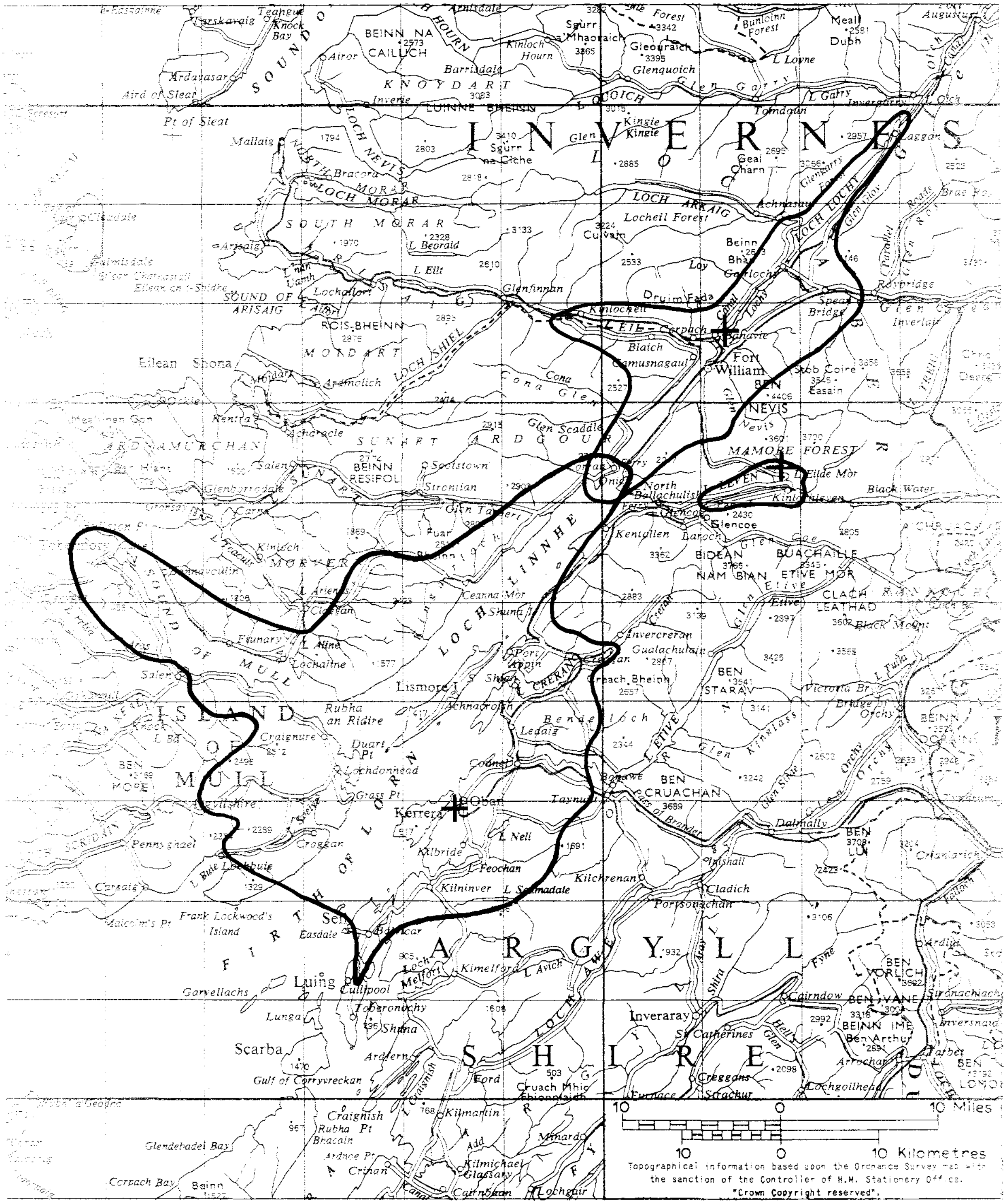


Fig. 10

Composite map showing the nominal service area limits [field strength = 40 dB(μV/m)] of the television service in the Great Glen



Topographical information based upon the Ordnance Survey map with the sanction of the Controller of H.M. Stationery Office. "Crown Copyright reserved".

Fig. 11

Composite map showing the nominal service area [field strength = 48 dB(μV/m)] of the v.h.f. sound service in the Great Glen

APPENDIX I

Great Glen Chain

	FORT WILLIAM		BALLACHULISH
	Television	V.H.F. Sound	Television
BAND	I	II	I
CHANNEL	5	-	2
FREQUENCIES	Vision: 66·75 Mc/s Sound: 63·25 Mc/s	Light: 89·3 Mc/s Third: 91·5 Mc/s Home: 93·7 Mc/s	Vision: 51·766875 Mc/s Sound: 48·266875 Mc/s
SITE HEIGHT (a.m.s.l.)	50 ft (15·2 m)	50 ft (15·2 m)	50 ft (15·2 m)
AERIAL HEIGHT (a.g.l.)	147 ft (45 m)	118 ft (36 m)	110 ft (33·5 m)
TRANSMITTER POWER	1 kW (two 0·5 kW units)	1 kW (one 1 kW unit)	0·1 kW (one 0·1 kW unit)
AERIAL	Two tiers (super turnstile)	Two tiers (super turnstile)	Two tiers (crossed dipoles)
E.R.P.	1·4 - 1·8 kW	1·2 - 1·7 kW	14·4 - 112 watts
POLARIZATION	Horizontal	Horizontal	Vertical
H.R.P.	See Fig. 3	See Fig. 4	See Fig. 9
RESEARCH DEPARTMENT REPORT NO.	No report issued		E-089

	KINLOCHLEVEN		OBAN	
	Television	V.H.F. Sound	Television	V.H.F. Sound
BAND	I	II	I	II
CHANNEL	1	-	4	-
FREQUENCIES	Vision: 44·983125 Mc/s Sound: 41·483125 Mc/s	Light: 89·7 Mc/s Third: 91·9 Mc/s Home: 94·1 Mc/s	Vision: 61·75 Mc/s Sound: 58·25 Mc/s	Light: 88·9 Mc/s Third: 91·1 Mc/s Home: 93·3 Mc/s
SITE HEIGHT (a.m.s.l.)	900 ft (274 m)	900 ft (274 m)	400 ft (122 m)	400 ft (122 m)
AERIAL HEIGHT (a.g.l.)	50 ft (15·2 m)	67 ft (20·2 m)	132 ft (40 m)	162 ft (49·4 m)
TRANSMITTER POWER	4 watts	7 watts	1 kW (two 0·5 kW units)	1·5 kW (two 1 kW units)
AERIAL	Single vertical dipole	Single tier (crossed dipoles)	Two tiers (vertical dipoles)	Single vertical dipole
E.R.P.	0·62 - 5 watts	1·7 - 2·3 watts	0·36 - 3·2 kW	1·25 - 1·7 kW
POLARIZATION	Vertical	Horizontal	Vertical	Horizontal
H.R.P.	See Fig 5	See Fig. 6	See Fig. 7	See Fig.8
RESEARCH DEPARTMENT REPORT NO.	E-088		E-090	

APPENDIX II

Great Glen Chain

Town	Field Strength (dB(μV/m)) for Stated Percentage Locations					
	Television			V.H.F. Sound		
	10%	50%	90%	10%	50%	90%
Fort William						
Ardgour	86	61	49	73	65	51
Caol	105	100	97	106	103	99
Corpach	86	74	69	86	75	71
Fort William	101	92	86	103	94	86
Lochyside	103	99	96	108	104	96
Spean Bridge	67	62	56	65	60	52
Kinlochleven						
Kinlochleven	87	83	79	90	88	78
Ballachulish						
East Laroch	83	79	76			
Glencoe	84	78	73			
Kinlochleven	57	53	48			
North Ballachulish	93	90	86			
Onich	88	82	64			
West Laroch	84	80	75			
Oban						
Black Crofts	66	63	58	82	78	70
Connel	56	52	46	66	60	51
Craignure	75	71	69	77	72	68
Cullipool	51	45	41	45	42	35
Dunstaffnage	79	73	56	95	85	62
Easdale	51	49	45	51	40	31
Lochaline	70	66	63	81	78	72
Lochbuie	52	48	37	50	43	37
New Selma	70	68	64	81	77	71
Oban	106	97	87	121	107	94
Port Appin	58	53	45	69	62	51
Portnacroish	60	58	53	69	61	57
Salen	41	39	37	41	37	33
Taynuilt	50	46	40	43	39	33
Tobermory	65	61	55	82	72	61

ALG

Printed by BBC Research Department, Kingswood Warren, Tadworth, Surrey